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Claims:

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1. An information management system comprising a plurality of nodes connected to each other via a network, wherein each of the plurality of nodes comprises:
- 5 a storage for storing information to be shared among the plurality of nodes; and
- an update manager for managing an update of the information using an updated minimum unit of the information, the updated minimum unit including an updated portion of the information.
2. The information management system according to claim 1, wherein, when an update occurs at the node, the update manager transmits an updated minimum unit of the information to another node.
3. The information management system according to claim 1, wherein, when an update occurs at the node, the update manager transmits update information to another node, the update information including identification information identifying an updated minimum unit of the information.
4. The information management system according to claim 2, wherein, when receiving an updated minimum unit of the

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the update manager determines whether the update

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time of the update information received is later than an updated
time of the information currently stored in the storage, and
when the update time of the update information
received is later than an updated time of the information
5 currently stored in the storage, the update manager requests
transfer of an updated minimum unit of the information.

9. The information management system according to
claim 1, wherein, when an update occurs at the node, the update
manager transmits an updated minimum unit of the information
10 to another node at a plurality of predetermined times.

10. The information management system according to
claim 1, wherein, when an update occurs at the node, the update
manager transmits update information to another node at a
plurality of predetermined times, the update information
15 including identification information identifying an updated
minimum unit of the information.

11. The information management system according to
claim 10, wherein the update manager manages the update of the
information using an update time at which the update of the
20 information occurs, the update information further includes the
update time.

12. The information management system according to

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the update manager determines whether the update time of the update information received is later than an updated

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time of the information currently stored in the storage, and
when the update time of the update information
received is later than an updated time of the information
currently stored in the storage, the update manager uses the
5 identification information to request transfer of an updated
minimum unit of the information from the control node.

16. The information management system according to
claim 6, further comprising a control node for controlling
communications between the nodes on the network.

10 the control node comprising:
an information storage for storing the information
stored in the storage of each of the nodes;
an information manager for managing the
information for each of the nodes and an update time thereof;
15 a update information receiver for receiving an
update information from a first node at which an update of the
information occurs; and

an update controller for
selecting a second node having the update time of the
20 information stored therein, which is later than the update time
included in the update information received from the first node,
and

transmitting the updated minimum unit of the information
identified by the identification information included in the
25 updat information r ceived from the first node, to th second

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node.

17. A structured document processing system comprising a network composed of a server device and a plurality of client devices, the server device storing a structured document
5 composed of a plurality of elements which are hierarchically structured, each of the elements being a constituent unit of the structured document, and each of the client devices storing a duplication of the structured document,

the server device comprising:

10 an update manager for managing an update of the structured document using an updated minimum element of the structured document, the updated minimum element including an updated portion of the structured document.

18. The structured document processing system
15 according to claim 17, wherein the server device further comprises a transmission section, the update manager instructing the transmission section to transmit an updated minimum element of the structured document to a client device when the structured document has been updated.

20 19. The structured document processing system according to claim 17, wherein the server device further comprises a transmission section, the update manager instructing the transmission section to transmit update

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information to a client device when the structured document has been updated, the update information including identification information identifying an updated minimum element of the structured document.

5 20. The structured document processing system according to claim 17, wherein the update manager manages the update of the structured document using an update time at which the update of the structured document occurs.

 wherein, when an update occurs at the node, the
10 update manager instructing the transmission section to transmit update information to a client device, the update information including the update time.

 21. The structured document processing system according to claim 20, wherein, when a client device receives
15 the update information from the server device, the client device updates the structured document stored therein based on the update information received.

 22. The structured document processing system according to claim 21, wherein each of the client devices
20 comprises:

 a comparator for comparing the update time of the update information received is later than an updated time of the structured document currently stored therein; and

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a transmission controller for requesting transfer
of an updated minimum element of the structured document when
the update time of the update information received is later than
the updated time of the structured document currently stored
5 therein.

23. The structured document processing system
according to claim 17, wherein the update manager transmits an
updated minimum element of the structured document to a client
device at a plurality of predetermined times.

10 24. The structured document processing system
according to claim 17, wherein the update manager transmits
update information to the client device at a plurality of
predetermined times, the update information including
identification information identifying an updated minimum
15 element of the structured document.

25. The structured document processing system
according to claim 24, wherein the update manager manages the
update of the structured document using an update time at which
the update of the structured document occurs, the update
20 information further includes the update time.

26. The structured document processing system
according to claim 17, further comprising:

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28. The structured document processing system according to claim 26, wherein, when a client device receives the update information from the gateway server device, the client device updates the duplication of the structured document stored therein based on the update information

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29. \ The structured document processing system

5 a comparator for comparing the update time of the
update information received is later than an updated time of
the structured document currently stored therein; and

10 a transmission controller for requesting transfer
of an updated minimum element of the structured document when
the update time of the update information received is later than
the updated time of the structured document currently stored
therein.

30. The structured document processing system

15 a gateway server device performing protocol
processing between the server device and each of the client
devices,

wherein the server device transmits update information including an update time and the updated minimum element to the gateway server device.

wherein the gateway server device comprises:
an structured document storage for storing the
duplication of the structured document stored in the client
device;

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detecting that an update occurs at the node; and
transmitting an updated minimum unit of the
information to another node.

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33. The information management method according to claim 31, wherein the step (b) comprises the steps of:
detecting that an update occurs at the node; and
transmitting update information to another node,
5 the update information including identification information identifying an updated minimum unit of the information.

34. The information management method according to claim 32, further comprising the steps of:

at a node receiving an updated minimum unit of the
10 information from another node,

c) updating a corresponding minimum unit of the information stored in the storage using the updated minimum unit received.

35. The information management method according to
15 claim 31, wherein the information comprises a plurality of elements which are hierarchically structured, wherein a minimum element including the updated portion of the information is determined as the updated minimum unit.

36. The information management method according to
20 claim 31, wherein in the step (b), the update of the information is managed using an update time at which the update of the information occurs,

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at a node receiving the update information from another node,

c) updating the information stored in the storage

38. The information management method according to 37, wherein the step (c) comprises the steps of:

determining whether the update time of the update
received is later than an updated time of the

information currently stored in the storage; and

when the update time of the update information received is later than an updated time of the information currently stored in the storage, requesting transfer of an updated minimum unit of the information.

39. The information management method according to

claim 31, wherein, when an update occurs at the node, an updated minimum unit of the information is transmitted to another node at a plurality of predetermined times.

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5 identification information identifying an updated minimum unit
of the information.

10 the update information further includes the update time.

15 the method further comprising the steps of:
 at the control node.
 c) managing the information stored in the storage
for each of the nodes;
 d) receiving an update information from a first
20 node at which an update of the information occurs; and
 e) transmitting the update information received
from the first node to a second node.

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46. The information management method according to claim 36, the system further comprises a control node for

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at th server device,

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a) managing an update of the structured document using an updated minimum element of the structured document, the updated minimum element including an updated portion of the structured document; and

5 b) notifying the client devices on the network that the structured document is updated when a part of the structured document has been changed.

48. The structured document updating method according to claim 47, further comprising the steps of:

10 at a client device receiving an updated minimum element of the structured document from the server device,

c) updating a corresponding minimum element of the structured document stored therein using the updated minimum element received.

15 49. The structured document updating method according to claim 47, wherein in the step (a), the update of the information is managed using an update time at which the update of the information occurs,

wherein the step (b) comprises the step of:

20 transmitting update information to the client devices, the update information including the update time.

50. The structured document updating method according to claim 49, further comprising the step of:

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at a client device receiving the update information from the server device.

c) updating the information stored therein based on the update information received.

5 51. The structured document updating method according to claim 50, wherein the step (c) comprises the steps of:

determining whether the update time of the update information received is later than an updated time of the structured document currently stored therein; and

10 when the update time of the update information received is later than an updated time of the structured document currently stored therein, requesting transfer of an updated minimum element of the structured document.

15 52. The structured document updating method according to claim 47, wherein an updated minimum unit of the structured document is transmitted to the client devices at a plurality of predetermined times.

20 53. The structured document updating method according to claim 47, wherein update information is transmitted to the client devices at a plurality of predetermined times, the update information including identification information identifying an updated minimum unit of the structured document.

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54. The structured document updating method according to claim 53, wherein the update of the information is managed using an update time at which the update of the structured document occurs, the update information further includes the update time.

55. The structured document updating method according to claim 47, wherein the network further comprises a gateway server device performing protocol processing between the server device and each of the client devices,

the method further comprising the steps of:

at the gateway server device,

c) managing the structured document stored in each of the client devices;

d) receiving an update information from the server device; and

e) transmitting the update information received from the server device to a client device.

56. The structured document updating method according to claim 55, wherein in the step (e), the update information received from the server device is transmitted to the client device at a plurality of predetermined times.

57. The structured document updating method according to claim 55, further comprising the steps of:

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at the client device receiving the update
information from the gateway server device,
updating the structured document stored therein
based on the update information received.

5 58. The structured document updating system according
to claim 57, further comprising the steps of:

at the client device,
determining whether the update time of the update
information received is later than an updated time of the
10 structured document currently stored therein; and

when the update time of the update information
received is later than an updated time of the structured
document currently stored therein, using the identification
information to request transfer of an updated minimum unit of
15 the structured document from the gateway server device.

59. The structured document updating system according
to claim 47, wherein the network further comprises a gateway
server device performing protocol processing between the server
device and each of the client devices.

20 the method further comprising the steps of:

at the gateway server device,
storing the structured document stored in each of
the client devices in an information storage;

managing the structured document for each of the

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client devices and an update time thereof;

receiving an update information from the server device at which an update of the structured document occurs;

5 selecting a client device having the update time of the structured document stored therein, which is later than the update time included in the update information received from the server device; and

transmitting the updated minimum unit of the structured document identified by the identification
10 information included in the update information received from the server device, to the selected client device.

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60. A storage medium storing a computer program for performing information management in a system comprising a plurality of nodes connected to each other via a network, the
15 computer program at each of the plurality of nodes, comprising the steps of:

a) storing information to be shared among the plurality of nodes in a storage; and

b) managing an update of the information using an
20 updated minimum unit of the information, the updated minimum unit including an updated portion of the information.

61. A storage medium storing a computer program for updating a structured document in a network composed of a server device and a plurality of client devices, the server device

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storing a structured document composed of a plurality of
elements which are hierarchically structured, each of the
elements being a constituent unit of the structured document,
and each of the client devices storing a duplication of the
5 structured document, the computer program at the server device,
comprising the steps of:

a) managing an update of the structured document
using an updated minimum element of the structured document,
the updated minimum element including an updated portion of the
10 structured document; and

b) notifying the client devices on the network that
the structured document is updated when a part of the structured
document has been changed.

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